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UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/477,164	01/05/2000	JORG BOROWSKI	A72204US	8780

23720   7590   10/06/2003

WILLIAMS, MORGAN & AMERSON, P.C.
10333 RICHMOND, SUITE 1100
HOUSTON, TX 77042

EXAMINER
CHANG, EDITH M

ART UNIT	PAPER NUMBER
2634	

DATE MAILED: 10/06/2003   *12*

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

Office Action Summary	Application No.	Applicant(s)
	09/477,164	BOROWSKI ET AL.
	Examiner	Art Unit
	Edith M Chang	2634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>24 July 2003</u> .

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-18</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-18</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

    If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____ .

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

    a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)   4)☐ Interview Summary (PTO-413) Paper No(s). _____ .

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)   5)☐ Notice of Informal Patent Application (PTO-152)

3)☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .   6)☐ Other: .

DETAILED ACTION

Claim Objections

1.   Claim 5 is objected to because of the following informalities: It suggests to add definition

(e.g. k's range, what k represents/is) to define the symbol "k" cited in the claim.   Appropriate

correction is required.

Claim Rejections - 35 USC § 102

2.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on
> sale in this country, more than one year prior to the date of application for patent in the United States.

3.   Claims 1-2, 5, & 18 are rejected under 35 U.S.C. 102(b) as being anticipated by

Subramanian (US Patent 5361276).

Regarding **claim 1**, Subramanian discloses a method of a spread spectrum

communication receiver (FIG.1, FIG.4), the receiver (FIG.1) is arranged to despread a digital

code-spread signal having a first data rate (154 FIG.1) to provide at least one despread data

signal having a second lower data rate (152-116 FIG.1). The method comprises: determining a

frequency offset by processing successive samples of the despread data signal (114 FIG.1, 424-

426 FIG.4A); generating a correction sequence from the frequency offset (150 FIG.1, FIG.4B);

combining the digital code-spread signal with the correction sequence from the despread data

signal (156-106-150 FIG.1, 408 FIG.4A).

Regarding **claim 2**, Subramanian discloses a filter for filtering the frequency offset to reduce noise (130 FIG.1).

Regarding **claim 5**, Subramanian discloses the up-sampled (column 6 lines 476-54) complex correction sequence is equal to exp $\{j\phi_{offs}(k)\}$ (column 13 lines 45-60, the equation at line 60 wherein the $2\pi\Delta f(k)$ is the $\phi_{offs}(k)$) where $\phi_{offs}(k)$ represents phase offset value are interpolated from an average phase difference (column 10 lines 34-39, column 10 line 46-column 11 line 6, column 12 lines 45-55).

Regarding **claim 18**, Subramanian discloses down-converting the digital code-spread signal to a lower rate (104-106 FIG.1).

Claim Rejections - 35 USC § 103

4.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5.   Claims 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Subramanian (US Patent 5361276) in view of Kojima (U.S. Patent 5579338).

Regarding **claim 3**, further Kojima teaches performing the mathematical operation (60-62 Fig.5, column 9 line 50-column 10 line 15) in the step of determining a frequency offset. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the operation taught by Kojima in Subramanian's phase/frequency estimator to perform the mathematical operations required to generate the frequency offset to have a simple configuration

of a digital circuit of a code-correlator of a SS communications system receiver (column 3 lines 54-60 '338).

Regarding **claim 4**, further Kojima discloses the spread spectrum communication system is a CDMA system (column 1 lines 14-20). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the Kojima's teaching to have the Subramanian's spread spectrum receiver with rake fingers used in the CDMA system to identify main and multipath signals (Abstract '276, column 1 lines 10-20).

6.   Claims 6-7, & 13-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Subramanian (US Patent 5361276) in view of Belotserkovsky et al. (US Patent 6621857 B1).

Regarding **claims 6 & 13**, except to explicitly show the RF signal receiver for generating an analog signal from a received RF signal, Subramanian discloses all subject matter claimed. The receiver comprises: an analog to digital converter (104 FIG.1); a digital signal despreader (108, 122 FIG.1 & 3) using the PN code to despread the code-spread signal having a first data rate (BASEBAND INPUT FIG.3) and obtaining the despread signal having a second data rate which is lower than the first data rate ($r_i(k)$ FIG.3, column 10 lines 7-10); and a frequency corrector (114-118-120-150 FIG.1) comprising a feedback loop (130 FIG.1, column 4 lines 25-28) including a frequency offset detector (114-120 FIG.1) and a combiner (106 FIG.1, 408 FIG.4A where the down converter comprise the combiner) for combining the frequency correction with the code-spread signal. *However* Belotserkovsky et al. teaches the RF signal receiver (112/122 FIG.1). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the plurality of RF signal receivers taught by Belotserkovsky et

al. in Subramanian's system to completely show every components of the spread spectrum receiver from the signal received from the antenna.

Regarding **claim 7**, Subramanian discloses a filter for filtering the frequency offset to reduce noise (130 FIG.1).

Regarding **claims 14 &16**, Subramanian discloses a down-converter (106 FIG.1) communicatively coupled between the analog to digital converter (104 FIG.1) and the digital signal despreader (103 FIG.1), wherein the down-converter down-converts the code-spread digital signal to a lower rate.

Regarding **claims 15 & 17**, further Belotserkovsky et al. teaches the timing circuitry (402 FIG.4) communicatively coupled between the analog to digital converter (401 FIG.4) and the down-converter (403 FIG.4/403 FIG.5) to performing a timing correction function (column 6 lines 41-44). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the timing circuitry in Subramanian's system to control the sampling switches (350 FIG.3 '276) to establish sampling synchronization (column 6 lines 53-55).

7.   Claims 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Subramanian (US Patent 5361276) in view of Belotserkovsky et al. (US Patent 6621857 B1), further in view of Kojima (U.S. Patent 5579338).

Regarding **claim 8**, further Kojima teaches performing the mathematical operation (60-62 Fig.5, column 9 line 50-column 10 line 15) in the step of determining a frequency offset. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the operation taught by Kojima in Subramanian's phase/frequency estimator to perform the mathematical operations required to generate the frequency offset to have a simple configuration

of a digital circuit of a code-correlator of a SS communications system receiver (column 3 lines 54-60 '338).

Regarding **claim 9**, further Kojima discloses a multiplier (10/12 Fig.5/9) for multiplying the code-spread signal by a correction factor (62/66 Fig.5/9) prior to dispreading the code-spread signal. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the correction factor taught by Kojima in Subramanian's phase/frequency estimator detailing the frequency correcting that the multiplier in Subramanian's down converter multiplies the code-spread signal by a correction factor to have an efficient configuration of a digital circuit of a SS communications system receiver (Abstract, column 3 lines 54-60).

Regarding **claim 10**, further Kojima discloses an interpolator (60-68, 80 Fig.9) for calculating phase offset values from an average phase difference calculated from samples of the despread signal (column 9 line 50-column 10 line 15). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the interpolator taught by Kojima in Subramanian's phase/frequency estimator to detail the calculation of the offset values to have a simple configuration of a digital circuit of a SS communications system receiver (Abstract, column 3 lines 54-60).

Regarding **claim 11**, further Kojima discloses the spread spectrum communication system is a CDMA system (column 1 lines 14-20). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the Kojima's teaching to have the Subramanian's spread spectrum receiver with rake fingers used in the CDMA system to identify main and multipath signals (Abstract '276, column 1 lines 10-20).

8.   Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Subramanian (US

Patent 5361276) in view of Belotserkovsky et al. (US Patent 6621857 B1), further in view of

Bunker et al. (US 6314128 B1).

Regarding **claim 12**, Bunker et al. further teaches the spread spectrum communication

system is a wireless local loop link. At the time of the invention, it would have been obvious to a

person of ordinary skill in the art to deploy the Subramanian's communication system in the

wireless local loop link, not limited to military applications to reduce the interference (column 1

lines 13-25 '128).

Conclusion

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Edith M Chang whose telephone number is 703-305-3416. The

examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Stephen Chin can be reached on 703-305-4714. The fax phone number for the

organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding

should be directed to the receptionist whose telephone number is 703-305-4800.

Edith Chang
September 25, 2003

STEPHEN CHIN
SUPERVISORY PATENT EXAMINI
TECHNOLOGY CENTER 2600